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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,874	07/21/2003	Brian K. Tanner	PANA-01061US1 SRM/MLR	5902
23910	7590	05/03/2005	EXAMINER TZENG, FRED	
FLIESLER MEYER, LLP FOUR EMBARCADERO CENTER SUITE 400 SAN FRANCISCO, CA 94111			ART UNIT 2651	PAPER NUMBER

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/623,874

**Applicant(s)**

TANNER, BRIAN K.

**Examiner**

Fred Tzeng

**Art Unit**

2651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6 and 7 is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/26/2004</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

1. Claims 1-7 are presented for examination.

### ***Specification***

2. The disclosure is objected to because of the following informalities: There is summary section in the specification disclosure.

Appropriate correction is required.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

4. Claim 4 is objected to because of the following informalities: a semicolon (;) is missing from the end of the limitations on line 2. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 3, 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Kuroiwa et al (USPN 6,757,129), hereafter as Kuroiwa.

RE claim 1, Kuroiwa discloses a method to reduce the power consumed by a data storage device **(see column 1 lines 60-67 and column 2 lines 1-9; i.e., the PWM control method for reducing power consumed by a disk drive)**, comprising: providing a data storage device **(see column 7 lines 16-18 and figure 1)** including: a rotary actuator assembly **(see figure 1 and column 7 lines 25-30; i.e., the rotary actuator assembly between head 106 and VCM 108)**; a voice coil motor connected with the rotary actuator assembly **(see column 7 lines 28-30 and figure 1; the voice coil motor 108)**; wherein the voice coil motor is electrically connected with two terminals **(see figure 4 and column 10 lines 48-55; i.e., the VCM 108 is electrically connected with terminal amplifier 3 and terminal amplifier 4, wherein amplifier 3 has voltage  $V_{cmp}$  and amplifier 4 has voltage  $V_{cmn}$ )**; applying a first voltage potential across the two terminals of the voice coil motor to cause the rotary actuator assembly to move **(see figure 5 and column 10 lines 48-66 and column 9 lines 20-40; i.e., the voltage difference between terminal voltage  $V_{cmp}$  and terminal voltage  $V_{cmn}$  corresponding to the low peak of  $V_{osc}$  is the first voltage potential applied across the two terminals of the voice coil motor 108 to cause the rotary actuator assembly to move)**; applying a second voltage potential across the two terminals of the voice coil motor **(see figure 5 and column 11 lines 18-47 and column**

**10 line 56 – column 11 line 3; i.e., the voltage difference between terminal voltage Vcmp and terminal voltage Vcmn corresponding to the high peak of Vosc is the second voltage potential applied across the two terminals of the VCM 108);** repeatedly switching between applying the first voltage potential and the second voltage potential across two terminals of the voice coil motor **(see figure 5 and column 10 line 56 – column 11 line 3, 18-26, 30-35, 53-67; i.e., Vs is sampled accordingly to sampling pulse Ps, such that the voltage difference between Vcmp and Vcmn at low peak of Vosc as first voltage potential and the voltage difference between Vcmp and Vcmn at high peak of Vosc as second voltage potential being repeatedly switched)** such that an approximately constant current is maintained across two terminals of the voice coil motor **(see column 1 line 62 – column 2 line 9; i.e., while the drive current amount of the VCM is fixed to a value or constant current, the ratio of the turn-ON or turn-OFF of the drive current is changed).**

RE claim 3, Kuroiwa discloses a processor **(see column 7 lines 38-41 or figure 1; the CPU 261 or controller 260)** having instructions for: applying a first voltage potential across the two terminals of the voice coil motor to cause the rotary actuator assembly to move **(see figure 5 and column 10 lines 48-66 and column 9 lines 20-40; i.e., the voltage difference between terminal voltage Vcmp and terminal voltage Vcmn corresponding to the low peak of Vosc is the first voltage potential applied across the two terminals of the voice coil motor 108 to cause the rotary actuator assembly to move);** applying a second voltage potential across the two terminals of the voice coil motor **(see figure 5 and column 11 lines 18-47 and column**

**10 line 56 – column 11 line 3; i.e., the voltage difference between terminal voltage  $V_{cmp}$  and terminal voltage  $V_{cmn}$  corresponding to the high peak of  $V_{osc}$  is the second voltage potential applied across the two terminals of the VCM 108);** repeatedly switching between applying the first voltage potential and the second voltage potential across two terminals of the voice coil motor (**see figure 5 and column 10 line 56 – column 11 line 3, 18-26, 30-35, 53-67; i.e.,  $V_s$  is sampled accordingly to sampling pulse  $P_s$ , such that the voltage difference between  $V_{cmp}$  and  $V_{cmn}$  at low peak of  $V_{osc}$  as first voltage potential and the voltage difference between  $V_{cmp}$  and  $V_{cmn}$  at high peak of  $V_{osc}$  as second voltage potential being repeatedly switched)** such that an approximately constant current is maintained across two terminals of the voice coil motor (**see column 1 line 62 – column 2 line 9; i.e., while the drive current amount of the VCM is fixed to a value or constant current, the ratio of the turn-ON or turn-OFF of the drive current is changed**); receiving a command to perform an operation on the at least one disk (**see column 8 lines 24-41 or figure 1; the mode command MODE received by motor drive circuit 110 to perform mode operation, such as read mode operation or write mode operation or linear drive mode or PWM mode**); and maintaining the first voltage potential across two terminals of the voice coil motor (**see figure 5 and column 10 lines 48-67 and column 11 lines 1-3 and column 9 lines 20-40; i.e., the voltage difference between  $V_{cmp}$  and  $V_{cmn}$  corresponding to the low peak of  $V_{osc}$  is the first voltage potential applied and maintained across the two terminals of the voice coil motor 108 for at least one sampling pulse  $P_s$  cycle).**

RE claim 4, Kuroiwa discloses a system for storing and retrieving information (see figure 1 or column 7 lines 16-18 or column 1 lines 7-13), comprising: a rotatable means for storing data (see figure 1 or column 7 lines 20-21; i.e., the rotatable disk 100 for storing data); a positioning means for positioning a head to store or retrieve data on the rotatable means (see figure 1 or column 7 lines 28-30; i.e., the actuator assembly connected between the VCM 108 and the head 106 for positioning the head 106 to store or retrieve data on the disk 100); a means for moving the positioning means (see figure 1 or column 7 lines 28-30; i.e., the VCM 108 for moving the positioning actuator assembly); a means for applying a voltage to the means for moving such that the positioning means moves at a design rate (see column 7 lines 30-31 and column 11 lines 18-30 and figures 1&2&4; i.e., the motor drive circuit 110 supplies a voltage  $V_s$  to the VCM 108 for moving the positioning means at a design rate); and a means for selectively switching between a first voltage and a second voltage such that an approximately constant current is delivered to the means for moving (see figures 1, 4&5 and column 8 lines 23-42 and column 10 lines 30-67 and column 11 lines 1-3 and column 1 line 60 – column 2 line 9; i.e., the controller 260 determines motor drive circuit 110 to enter into PWM mode accordingly to the magnitude of the move drive current, then VCM driver 114 selectively switching between a first voltage and a second voltage applied to the VCM 108 accordingly to sampling pulse  $P_s$  produced by the timing control circuit 7 such that the drive current amount of the VCM 108 is fixed to a value or constant current. For detail rejection rationale, please see claim 1).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuroiwa et al (USPN 6,757,129), hereafter as Kuroiwa.

Re claim 2, Kuroiwa discloses the invention substantially as claimed. Kuroiwa discloses that a sample/hold circuit 6 samples voltage Vs in synchronism with the sampling pulse Ps produced by the timing control circuit 7 (**see column 10 lines 63-66**), such that the switching of the ON and OFF state of drive current flowing through the coil of the VCM is in response to the sampling pulse Ps (**see column 11 lines 18-26 and figure 5**).

However, Kuroiwa does not specifically disclose that the switching is at a rate greater than 50 KHz.

But the range of switching rate greater than 50khz is akin to optimizing the values of a result effective variable. Therefore, determining the optimal value of a result effective variable would have been obvious and ordinarily within the skill of the art. **In re Boesch**, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

***Allowable Subject Matter***



9. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Claim 5 is allowable over the prior art of record because none of the prior art of record teaches or fairly suggests that removing the means for communication with a rotatable means from communication with the rotatable means when switching between a first voltage and a second voltage applied on a means for moving a positioning means on the rotatable means.

11. Claims 6 and 7 are allowable over the prior art of record because none of the prior art of record teaches or fairly suggests that removing a head from communication with a disk when power driver switches between applying a first voltage potential and a second voltage potential across the two terminals of a VCM such that a constant current is delivered to the VCM.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any inquiry concerning this communication from the examiner should be directed to Fred Tzeng whose telephone number is 571-272-7565. The examiner can normally be reached on weekdays from 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 571-273-7565 for After Final communications.

14. Informal regarding the status of an application may be obtained from the Patent Application Information Retrieval (**PAIR**) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Fred F. Tzeng", with a stylized flourish at the end.

Fred F. Tzeng

April 25, 2005